



**Project name:** Strongman Open Cut Mine  
**Client:** Solid Energy New Zealand Limited  
**Project date:** 2010 - 2015

**Project description**

Strongman mine, a coal mine located north of Greymouth, was historically an underground mine (operating since the late 1930's). It gradually transitioned into open pit mining from the early 2000's.

By 2009, Strongman mine open cut was a depleted and finished open cut coal mine. Geotech approached Solid Energy New Zealand with a methodology on how to gain additional resource from the mine, by using precision blasting to steepen up pit highwalls enabling extraction of the exposed coal. Geotech provided SENZ for a price for coal landed on the ROM (run of mine) pad, and this offer was accepted by Solid Energy. Geotech commenced mining successfully in 2010. SENZ provided mine planning and coal volumes required. Geotech run the Strongman open pit mine from 2010 – 2015. The target each month was for removal of 100,000m<sup>3</sup> of overburden, and 12,000 T of coal, all excavated with Geotech mining equipment. Geotech had 34 full time staff onsite. Geotech provided resource assessment and extraction planning, and all drill and blast services onsite (from blast design and drilling to initiation). A technically advanced emulsion plant (one of only a couple in the country), provided flexibility and efficiency gains in blast management.



Strongman Mine is located in an extreme environment. The landscape is steep and at a high altitude, with the offices located 600 meters above sea level. Annual rainfall exceeds 6 metres, with snowfall a regular occurrence during the winter months. Haul roads, pit walls, overburden disposal sites, and daily life on the mine are made challenging due to these environmental conditions. Careful construction of these components of the mine plan has been critical for the success of Strongman mine, both for contractor and client.



Environmental issues such as water management and ground control are important aspects in the pristine environment that surrounds Strongman. Initiatives such as redirecting mine water into underground mine workings have been used to naturally filter suspended sediment, without having to use chemical flocculants. Ground control with regards to rehabilitation of the pits and overburden disposal sites for stability, longevity and overall safety was managed professionally, with regular input from the West Coast Regional Council and Department of Conservation.



Historic and recent mining activities onsite prior to the arrival of Geotech had resulted in coal fires burning in the underground workings. These fires were constantly monitored and constrained. The introduction of "stowing" onsite was used to infill underground workings with saturated crusher dust, and pressure injection of bentonite clay into voids was used to reduce air flow to the fires, essentially limiting their fuel.

**Geotech's role**

Geotech was contract mining on behalf of SENZ. Funding, fleet configuration and maintenance, mine planning, resource assessment and extraction/production planning were all Geotech's responsibility.



**Resources applied**

The Strongman mining fleet included a number of excavators, haul trucks, articulated dump trucks, bull dozers, drill rigs (for blast and exploration) and support equipment including:

- Komatsu Excavator PC1250 (operating weight 108t, 514kW, bucket capacity 5m<sup>3</sup>)
- Komatsu Excavator PC750 (operating weight 74t, 338kW, bucket capacity 4m<sup>3</sup>)
- Komatsu Excavator PC450 (operating weight 43t, 246kW, bucket capacity 2m<sup>3</sup>, high breakout boom with rock thumb)
- Komatsu Excavator PC300 (operating weight 31t, 180kW, bucket capacity 1.5m<sup>3</sup>, machines fitted with milling heads, drills and rock breakers for precision excavation in rock) – 4 units
- Komatsu Haul Trucks HD605 (load capacity 63t/40m<sup>3</sup>) – 3 units
- Komatsu Articulated Dump Trucks HM400 (load capacity 36t/22m<sup>3</sup>) – 4 units
- Komatsu Bulldozers D11N
- Komatsu 155
- Komatsu WD600 wheeled dozer
- Ingosall Rand 789 drill rig
- Sandvik DHA 600 Zoomtrak drill rig
- Montabert CPA X-tend HC150 CP boom mounted drill rig

Support plant included Komatsu wheeled loaders, Bomag rollers, John Deere graders, generators, high explosive emulsion plant and high explosives magazine and inventory.

**Innovation and performance**

Geotech was originally contracted by SENZ to control underground fires in Strongman I and II underground mines. We developed and proposed a mine plan for recommencing open cast operations, winning coal, while reducing fire liabilities. The coal recovery programme retained a strong focus on containment and stopping of the historic fires, with coal recovery undertaken to support these goals. Initial estimates were that around 60,000 tonne of hard coking coal could be recovered for the client. A contract to mine was negotiated in 2010. By end of contract, over 250,000 tonne of hard coking coal had been recovered for the client, along with a significant reduction in their fire liabilities.

Strongman is a hot temperature/gassy environment, and Geotech established a rigorous health and safety system to support their work programme. Due to the nature of the terrain and the environmental conditions imposed on the site, specialized blasting techniques (including the use of underground bolting and precision blasting methods to a surface application) were developed.

Geotech achieved all key performance indicators – notably safety, environmental performance, and productivity (time and cost).

**Project value**

\$30.5million to date

**Project reference**

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